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INTRODUCTION TO THE DAHlgREN GENERAL CATALOG. (U)  
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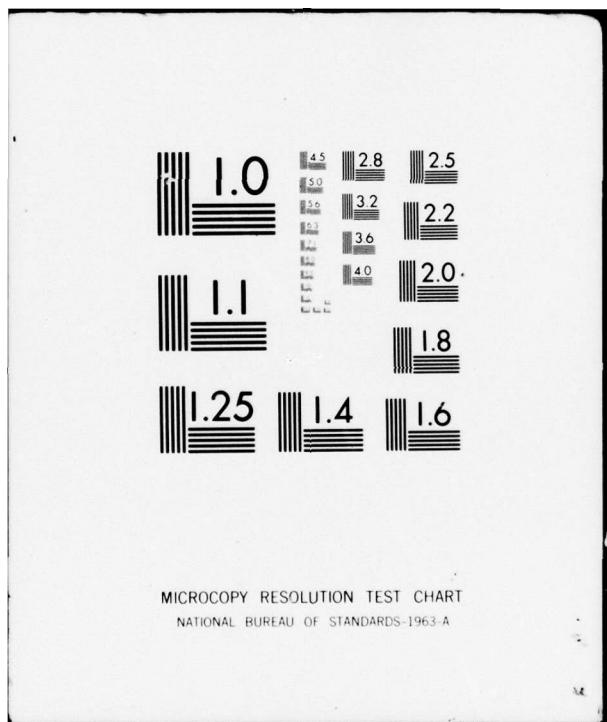
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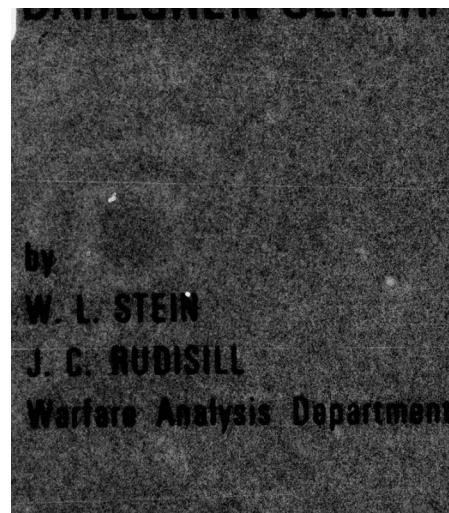
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**NAVAL SURFACE WARFARE CENTER  
DAHLGREN DIVISION  
Dahlgren, Virginia  
SERIAL**

**Dr. R. A. Aecker, Jr., Capt., USN  
OCIC and Assistant Commander**

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A description of the procedure used in constructing the <u>Dahlgren General Catalog</u> is presented in this report. Extensive lists of the discrepancies detected in the various source catalogs are presented in Appendixes A through E. The final version of the catalog contains 19,045 stars of apparent visual magnitude 7.2 or brighter. The machine readable magnetic tape version of the catalog is divided into two parts: the positional catalog and the magnitude/color catalog.		

#### FOREWORD

This report was prepared in the Fire Control Presetting Analysis Branch (DK-51), FBM Geoballistics Division, Warfare Analysis Department under SSPO Task Assignment 36401.05. The catalog described herein was used in the evaluation of fire control software for advanced weapon systems.

Appreciation is expressed to the U.S. Naval Observatory, in particular to Dr. C. Smith, for allowing Naval Surface Weapons Center/Dahlgren Laboratory (NSWC/DL) access to magnetic tape versions of certain astronomical catalogs. We also gratefully acknowledge Mr. W. L. Murphy (DK-51) for his helpful comments during compilation of the catalog.

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This report contains a description of the procedures used in constructing the Dahlgren General Catalog (Publication pending). Extensive lists of discrepancies found in the following five sources are presented in the appendices:

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## INTRODUCTION

In the course of our investigation of advanced weapon systems, the need arose for a large data base of stars, along with their associated positional, magnitude, and color information. Since it was desirable to compile a list of all known stars brighter than visual magnitude 7.2, a complete and accurate catalog was needed. Therefore, a project to compile such a data base from available resource catalogs was initiated. A brief description of the need and utilization of this data base is set forth in Reference 1.

## AVAILABLE DATA SOURCES

To ensure that the data in the Dahlgren General Catalog (DGC) are as complete and as accurate as possible, we used the source catalogs listed in Table 1. Table 2 shows the types of data taken and the significant places for the data as given in the source catalogs. Both the published version of the source catalogs and the machine readable magnetic tape versions, as supplied by the U.S. Naval Observatory, were available.

These source catalogs can be grouped into two utilization categories: positional sources and magnitude/color sources. Some source catalogs contained information which could be placed in both categories. This grouping has influenced the form of the DGC. In particular, the catalog has been divided into two parts: a positional catalog and a magnitude/color catalog.

Table 1. Source Catalogs

<u>Catalog*</u>	<u>Epoch</u>	<u>Number of Stars</u>	<u>Year Published</u>	<u>Reference</u>
FK4	1950, 1975	1,535	1963	2
GC	1950	33,342	1937	3
SAO	1950	258,997	1966	4
BSC	1900, 2000	9,091	1964	5
USNO	1900	20,705	1968	6
MPE	NA**	20,327	1974	7

\*Full names of the catalogs are given in the list of references.

\*\*NA = Not available in the catalog.

Table 2. Significant Places for Data in the Resource Catalogs

Catalog			Annual and Secular Variation		Proper Motion		Parallax	Visual Magnitude
	$\alpha$	$\delta$	$\alpha$	$\delta$	$\alpha$	$\delta$		
FK4	0 <sup>h</sup> 001	0 <sup>m</sup> 01	0 <sup>s</sup> 001/c	0 <sup>m</sup> 01/c	0 <sup>s</sup> 001/c	0 <sup>m</sup> 01/c	0 <sup>s</sup> 001	0 <sup>m</sup> 01
GC	0 <sup>h</sup> 001	0 <sup>m</sup> 01	0 <sup>s</sup> 0001/yr	0 <sup>m</sup> 001/yr	0 <sup>s</sup> 0001/yr	0 <sup>m</sup> 001/yr	NA*	0 <sup>m</sup> 01
SAO	0 <sup>h</sup> 001	0 <sup>m</sup> 01	NA*	NA*	0 <sup>s</sup> 0001/yr	0 <sup>m</sup> 001/yr	NA*	0 <sup>m</sup> 1
BSC	1 <sup>s</sup>	1'	NA*	NA*	0 <sup>s</sup> 001/yr	0 <sup>m</sup> 001/yr	0 <sup>s</sup> 001	0 <sup>m</sup> 01
USNO	0 <sup>m</sup> 1	1'	NA*	NA*	NA*	NA*	NA*	0 <sup>m</sup> 01-0 <sup>m</sup> 001
MPE	NA*	NA*	NA*	NA*	NA*	NA*	NA*	0 <sup>m</sup> 01-0 <sup>m</sup> 001

\*NA = Not available in the catalog.

#### POSITIONAL INFORMATION

For each star in the positional division of the DGC, the following positional information is tabulated (if available): right ascension ( $\alpha$ ), declination ( $\delta$ ), annual and secular variation terms, third term, proper motion, and trigonometric parallax. Positional information from the FK4 is preferred because its reference system has been adopted by the International Astronomical Union as the fundamental reference system of stellar mean places. Since the SAO is based upon the FK4 system, and since it contains an extensive list of stars, it was chosen as the principal source catalog for right ascension, declination, and proper motion. If a star was not found there, then positional data from the GC was used, since the GC data were considered to be from the fundamental reference system next in quality to the FK4. Only one member of the DGC, HD 18242 (HD = Henry Draper number), could not be found in the FK4, SAO, or GC. Therefore, this star's positional information was obtained by interpolation in the BSC.

Just over 99 percent of the DGC stars have annual and secular variation terms listed. The FK4 was again chosen to be the fundamental data source. However, most of these data entries came from the GC (see the Annual and Secular Variation Terms section). For trigonometric parallax entries, the FK4 data took precedence over the BSC data. However, only about 18 percent of the DGC stars have trigonometric parallax information.

#### MAGNITUDE/COLOR INFORMATION

The magnitude/color division of the DGC contains visual magnitude, UBV magnitude and color data, and spectral class information. Although there is a great diversity between source catalogs with respect to the magnitude systems used, all visual and UBV magnitude systems were treated with equal weight, regardless of the source. This was done because we were primarily interested in listing the range in magnitude for a given star. Therefore, only the brightest and faintest visual magnitudes, along with the associated extremes in color data, were retained. In many cases, only the visual magnitude as tabulated in the SAO or GC could be found. This forced the use of these visual magnitude for stars having no other magnitude data. In order to be consistent, the visual magnitudes from these source catalogs for stars having the more accurate UBV magnitudes were examined. No indication is given in the DGC as to whether a star's maximum and/or minimum magnitudes are visual or UBV magnitudes, or from what source they come.

At least 49 percent of all stars in the DGC have UBV photoelectric magnitudes and associated color data. The USNO and MPE were the sources for the UBV information. Visual magnitudes were obtained from any of the other source catalogs.

For the stellar spectral classes, those listed in the USNO and MPE were given highest weight. Next in order of precedence was the SAO spectral class. For the remaining stars having no spectral type, the Catalogue of Stellar Spectra (Reference 8) and the Kennedy and Buscombe supplement (Reference 9) were consulted. Slightly more than 99 percent of all stars have spectral class entries. No luminosity classes are tabulated.

#### TREATMENT OF MULTIPLE SYSTEMS IN THE USNO AND MPE

Before construction of the DGC could commence, it was necessary to examine the multiple star systems in the USNO and MPE. During the compilation process of these catalogs, the compilers assumed that, for pairs of stars having angular separations of less than 5"0, the UBV data applied to the combined light of both components. However, the magnitudes listed in other source catalogs could, in some cases, refer to just an individual component of these multiple systems. In order to list the close doubles as a single entry in our catalog, it was necessary to compare the visual magnitude and UBV data to see if the information referred to both components or to a single component. Adjustments to the data were made according to how the multiple system would finally be entered in the DGC. For example, situations were found in the USNO

where combined magnitudes were tabulated (e.g., HD 12111 AB) in addition to magnitudes for the individual components (e.g., HD 12111 A and HD 121211 B). Here, each letter designates a separate component while AB designates the multiple system as an entity. In this case, only the data for the combined system would be listed in the general catalog. If any or all of the color data were missing for the combined system, then the color data from the brighter component were substituted. If color data were lacking for the combined system but were available for more than one individual component, then these were logarithmically combined to obtain the unobserved combined color information. All other magnitude and color data not referring to the combined system would be deleted.

In another situation, the USNO listed combined magnitudes for two or more stars having different HD numbers (e.g., HD 29094/5). For this case, other source catalogs were consulted to see if both, either, or neither HD numbers were found. If both were found in other catalogs, then the HD number of the star having the brighter visual magnitude was retained. If only one HD number was located, then only that HD number was listed in our catalog. If neither HD number could be found elsewhere, then the first one listed in the USNO was kept. All other references to the individual components not retained were deleted. For these two cases, the positional data would refer to either the brighter component only (in the case of double stars designated by the letters AB) or to the HD number retained (in the case of stars having multiple HD numbers).

#### CONSTRUCTION OF THE DGC

The basic steps in the compilation of the catalog were:

1. Each of the major source catalogs listed in Table 1 was sorted for stars having visual magnitudes of 8.5 or brighter. These stars formed a preliminary catalog consisting of 91,561 entries.
2. Duplicate entries occurring in the preliminary catalog were combined by cross-referencing the following star identification numbers:
  - a. B. Boss (GC)
  - b. H. Draper (HD)
  - c. Durchmusterung (DM)
3. Multiple star systems were treated as described in the previous section.

4. From this modified preliminary catalog, stars having the brighter limit of their visual magnitude range fainter than 7.2 were omitted before checkout of the remaining stars could begin.

5. To facilitate the construction process, the DGC was subdivided into two parts. The first part contains positional information, while the second part is comprised of magnitude and color data.

6. To detect possible identification errors, we examined the positions of duplicate entries to verify that they were indeed the same star before the entries were combined.

Although the preliminary catalog contains many duplicate entries and, therefore, is not completely reliable, the DGC has been thoroughly scrutinized and culled of any such discrepancies. Thus, we are confident that it contains all known stars of visual magnitude 7.2 or brighter, except in those situations where a component in a close multiple star system has been eliminated (see the previous section).

#### DESCRIPTION OF THE DGC

Each of the two divisions of the DGC contains 19,045 stars. The catalog members represent all stars in the source catalogs which meet the visual magnitude limit of 7.2 or brighter after the steps outlined in the previous section had been followed. The data were divided between the two sections of the catalog as indicated in Tables 3 and 4. The identification numbers used in the positional catalog are GC, DM, and HD; while in the color catalog, they are HR, GC, DM, HD, and FK4. Both catalogs are ordered according to ascending HD numbers. In the color catalog, there are letter designations which denote the components of multiple systems. The spectral class listed in the positional catalog is the more complete spectral class letter and sub-spectral class number, whereas the color catalog contains only the spectral class letter. For some multiple systems which are entered as combined components, there is more than one spectral class for the system. In this case, only the symbol, +, appears for the spectral class, indicating that more than one spectral class applies to the system. The two part DGC is available in a machine readable magnetic tape form.

Table 3. DGC Positional Data

Datum	Units
Identification Numbers	unitless
Spectral Class	unitless
Right Ascension ( $\alpha$ )	hours, minutes, seconds of time
Annual Variation ( $\alpha$ )	seconds per annum
Secular Variation ( $\alpha$ )	seconds per annum per century
Proper Motion ( $\alpha$ )	seconds per annum
Third Term ( $\alpha$ )	seconds per annum per century <sup>2</sup>
Declination ( $\delta$ )	degrees, minutes, arc seconds
Annual Variation ( $\delta$ )	arc seconds per annum
Secular Variation ( $\delta$ )	arc seconds per annum per century
Proper Motion ( $\delta$ )	arc seconds per annum
Third Term ( $\delta$ )	arc seconds per annum per century <sup>2</sup>
Parallax	arc seconds

Table 4. DGC Magnitude/Color Data

Datum	Units
Identification Numbers	unitless
Faintest Visual Magnitude	magnitude
Brightest Visual Magnitude	magnitude
Faintest Photoelectric Color Data	magnitude
Brightest Photoelectric Color Data	magnitude
Spectral Class	unitless

#### GENERAL COMMENTS

#### DISCREPANCIES DETECTED IN THE SOURCE CATALOGS

During the course of compiling the DGC, data from the source catalogs were meticulously cross-referenced. This resulted in the detection of numerous source catalog discrepancies. These discrepancies were found

during the process of cross-checking the various stellar identification numbers in our preliminary and general catalogs. Since all of the necessary resources to thoroughly examine all discrepancies were not available, the comments on some discrepancies will be incomplete and will require further investigation. It was found that many of the discrepancies had been documented previously. However, a brief explanation of those for which no documentation was found is given below.

#### BSC Discrepancies

In addition to the discrepancies found on the errata sheets supplied with the BSC, Table A-1 (Appendix A) lists those discrepancies detected in the USNO tape version of the BSC. All entries are identified by the Harvard Revised (HR) number. For those situations where a V magnitude discrepancy is indicated, it appears that additional UBV magnitude information has been added to the BSC tape from the USNO catalog. (The USNO or MPE may have to be consulted to aid in the determination of which value should be assumed correct.)

Numerous minor omissions relating to the remarks column and the Table of Compilation of Remarks (pp. 375-379 in the BSC<sup>5</sup>) were detected. The explanation on page 7 of the BSC implies that a star having a letter or asterisk in the remarks column should be found in the remarks table. This would indicate that HR 1876, 6756, and 8475 should occur in the remarks table, yet they do not. In addition, HR 7741 and 7746 are entered twice in the remarks table. HR 5833 is also entered twice in the remarks table, but the second entry should refer to HR 5853.

Many entries in the remarks table are found for which no symbol occurs in the remarks column. Table A-2 lists these objects by HR number. As explained on page 375 of the BSC,<sup>5</sup> many are variables (indicated by V) having information in the General Catalog of Variable Stars (Reference 10), while some are objects for which no information occurs in the BSC because they were eliminated from the third edition (indicated by E). Still, others fall into neither of these categories. Table A-3 lists those variable stars which would be expected to be listed in the remarks table (since the object has a variable star designation in column 9), yet which are not found there.

#### GC Discrepancies

The discrepancies found in the USNO tape version of the GC are listed in Table B-1 (Appendix B) and are identified by GC numbers. These discrepancies only arise because of differences in visual magnitudes between the published catalog and the USNO tape version.

### MPE Discrepancies

The discrepancies discovered in the MPE are tabulated in Table C-1 (Appendix C).

### USNO (Ochsenbein Update) Discrepancies

Table D-1 (Appendix D) lists the discrepancies detected in the most recent version of the USNO (Reference 11). These discrepancies are in addition to those found by FitzGerald (Reference 12) and by Ochsenbein (Reference 13). Each discrepancy is identified by its USNO running identification number (P.E. ID.). Also, numerous minor discrepancies were encountered in Ochsenbein (Reference 13), and these are tabulated in Table D-2.

### SAO Discrepancies

The SAO discrepancies can be divided into three categories. Table E-1 (Appendix E) lists those in the first category. They occur both in the publication and on the USNO tape version. In most cases, these discrepancies are partial omissions. It was found that the FK3 stars which were eliminated from the FK4 did not have DM numbers listed in the SAO. Therefore, many of the entries in Table E-1 require the addition of a DM number. Each entry is identified by its SAO number.

Table E-2 contains the second category of discrepancies. This is a list of FK4 stars for which we find discrepant positions in right ascension. These discrepancies pertain only to the USNO tape version of the SAO and are restricted to the  $+50^{\circ}$  declination band. Table E-2 lists the SAO number and its corresponding FK4 number.

According to page XI of the SAO<sup>4</sup>, this catalog resulted from a combination of the FK4, FK3, GC, etc. When duplications occurred, the entries were retained in the above order of precedence. Therefore, one would expect to find all GC stars not found in the FK4 or FK3. However, Table E-3 lists the final category of discrepancies: those GC stars not found in the SAO. These stars are tabulated by their GC and corresponding DM numbers.

### ANNUAL AND SECULAR VARIATION TERMS

The sources of annual and secular variations are, in order of priority, the FK4 and the GC. No transformation of the GC data to the FK4 system was attempted. A cursory examination of differences in the annual and secular variation terms between the two catalogs did not reveal

any differences greater than  $0^s.0020/yr$ , except for a few cases involving near polar stars.

#### FUTURE REVISIONS

If a major revision of the DGC should be undertaken in the future, source catalogs not previously used will be consulted. Examples of such catalogs are the Catalog of 5268 Standard Stars, 1950, Based on the Normal System N30 (N30), the Dritter Katalog Der Astronomischen Gesellschaft (AGK3), and the Catalogue of Stellar Identification (CSI) (References 14, 15, and 16, respectively). At the time our project was initiated, we did not have access to the AGK3 nor to the CSI, since they had not yet been published. New source catalogs such as the inevitable revision of the FK4 reference system (to be called the FK5) and any updated photoelectric catalogs will be incorporated into the revision of the DGC.

Finally, any future list of discrepancies will be examined and, if necessary, the DGC will be appropriately amended. The Centre de Données Stellaires (Stellar Data Center) in Strasbourg, France and the ICCA Data Task Force of NASA, Goddard Space Flight Center are two agencies with whom contact will be maintained for any such new source catalogs or lists of discrepancies.

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APPENDIX A

DISCREPANCIES IN THE BRIGHT STAR CATALOGUE

Table A-1. Discrepancies in BSC

HR Number	Comments
67	Change DM $+1^{\circ} 28$ to $+0^{\circ} 28$
186	Change DM $-60^{\circ} 49$ to $-60^{\circ} 48$
365	{ Change DM $-8^{\circ} 215$ to $+70^{\circ} 90$ Change GC 1490 to 1505
530	Change positional data accordingly
2024	Change HD 11155 to 11154
2273*	Change DM $+2^{\circ} 1148$ to $+1^{\circ} 1148$ V magnitude discrepancy arising from possible discrepancy in USNO (Reference 415, see <u>Royal Observatory Annals</u> , No. 7, p. 61) change 4.25 to 5.27
2350	Rybka and HD magnitudes are discrepant (change 4.09 to 6.39)
2426	Change GC 8636 to 8635
2685	Change DM $-60^{\circ} 908$ to $-59^{\circ} 908$
3104	Change DM $+46^{\circ} 1598$ to $+16^{\circ} 1598$ and change positional data accordingly
3317	Change DM $-17^{\circ} 2442$ to $-16^{\circ} 2442$
4128	{ Change DM $-60^{\circ} 1944$ to $-60^{\circ} 1945$ Change HD 91269 to 91270 and add GC 14450 (This is an erratum correction given in the HD catalog)
4791*	Change V = 5.02 to 6.59 (USNO star misidentified)
4792*	Change V = 6.59 to 5.02 (USNO star misidentified)
5228*	Change V = 4.55 to 6.30 (USNO star misidentified)
5640	Change GC 20373 to 20372
5703	Change DM $+15^{\circ} 4083$ to $-15^{\circ} 4083$
5743*	Change V = 5.16 to 5.64 (USNO discrepancy in Reference 378)
6187*	Change V = 6.89 to 5.62 (USNO star misidentified)
6514	Rybka and HD magnitudes are discrepant (change 5.46 to 6.52)
6952	HD indicates 170868 = $-38^{\circ} 12895$ = 5.95
6953	HD indicates 170867 = $-38^{\circ} 12896$ = 6.55
7030	Change DM $+31^{\circ} 13332$ to $+31^{\circ} 3332$
7233	Change DM $-55^{\circ} 19001$ to $-55^{\circ} 9001$
7509	Rybka and MPE are discrepant (change 5.35 to 6.48)
7680	Rybka and MPE are discrepant (change 5.38 to 6.35)
7704	Rybka and MPE are discrepant (change 5.39 to 6.29); change DM $+67^{\circ} 11226$ to $+67^{\circ} 1226$
7705	Change HD 191571 to 191570
8417	Change HD 209791 to 209790
8603	Change HD 214167 to 214168
8841	Change HD 219430 to 219449

\*Found only on USNO tape Version of BSC.

Table A-2. Discrepancies in BSC Remarks

<u>HR Number</u>	<u>HR Number</u>	<u>HR Number</u>	<u>HR Number</u>
85 (V)	2405 (V)	5147 (V)	7296 (V)
90 (V)	2472 (E)	5199 (V)	7458 (V)
92 (E)	2496 (E)	5261 (V)	7518 (V)
95 (E)	2671 (V)	5355 (V)	7539 (E)
108	2717 (V)	5395 (V)	7564 (V)
182 (E)	2742 (V)	5421 (V)	7570 (V)
284	2747	5435 (V)	7571 (V)
423 (V)	3185 (V)	5440	7600 (V)
663 (E)	3217	5644 (V)	7645 (V)
758 (V)	3232 (V)	5880 (V)	7804 (V)
832 (V)	3248 (V)	5894 (V)	7879 (V)
838	3515 (E)	5939 (V)	7886 (V)
867 (V)	3541 (V)	6039 (V)	7927 (V)
954 (V)	3671 (V)	6086 (V)	7932 (V)
1057 (E)	3803 (V)	6119 (V)	7941 (V)
1581 (V)	3882 (V)	6146 (V)	7988 (V)
1607 (V)	3884 (V)	6250	8007 (V)
1611 (V)	3917 (V)	6309 (E)	8084 (V)
1630 (E)	3999 (V)	6435	8113 (V)
1648 (V)	4064 (V)	6437 (E)	8145 (V)
1693 (V)	4153 (V)	6448 (V)	8156 (V)
1837 (V)	4163 (V)	6515 (E)	8263 (V)
1841 (E)	4195 (V)	6616 (V)	8296 (E)
1845 (V)	4267 (V)	6661 (V)	8297 (V)
1977 (V)	4271 (V)	6685 (V)	8318
2063 (V)	4276 (V)	6702 (V)	8350
2107	4645 (V)	6747 (V)	8731 (V)
2156 (V)	4800 (V)	6779 (V)	8762 (V)
2190 (V)	4807	7009 (V)	8775 (V)
2197 (V)	4808 (V)	7066 (V)	8850 (V)
2289 (V)	4820 (V)	7089 (V)	8945 (E)
2308 (V)	4846 (V)	7107 (V)	8991
2310 (V)	4853 (V)	7138 (E)	8992 (V)
2326	4902	7139 (V)	9030
2332 (V)	4909 (V)	7152 (V)	9045 (V)
2387 (V)	5101 (V)	7189 (E)	9047
		7220 (V)	9080 (V)

V = Variables

E = Eliminated from third edition

Table A-3. Objects Not Found in BSC Remarks Table

HR Number

345  
559  
868  
2974  
3041  
3978  
4008  
5082  
5540  
6299  
8196  
9056  
9090

APPENDIX B

DISCREPANCIES IN THE BOSS GENERAL CATALOGUE

Table B-1. Discrepancies in GC (USNO Tape Version)

<u>GC Number</u>	<u>Comments</u>
7632	$m_v$ discrepancy between tape (10.00) and book (9.23)
8817	$m_v$ discrepancy between tape (10.00) and book (9.2)
9476	$m_v$ discrepancy between tape (10.00) and book (8.3)
9708	$m_v$ discrepancy between tape (10.00) and book (8.8)
12246	$m_v$ discrepancy between tape (10.00) and book (9.6)
21503	$m_v$ discrepancy between tape (10.00) and book (8.89)

APPENDIX C

DISCREPANCIES IN THE MERMILLIOD PHOTOELECTRIC CATALOGUE

Table C-1. Discrepancies in MPE

<u>HD Number</u>	<u>Comments</u>
HD 24154	Discrepancy in V magnitude (HD indicates 6.82)
HD 121156	Star misidentified, should be HD 131156
HD 139669	Star misidentified, should be HD 114330
HD 212670	Discrepancy in V magnitude, 0.257 should probably be 6.257

APPENDIX D

DISCREPANCIES IN THE USNO UBV CATALOGUE (OCHSENBEIN UPDATE)

Table D-1. Discrepancies in USNO (Ochsenbein Update)

P.E. ID.	Comments
151	Positional data should be corrected
4085	Reference 127 should not have same P.E. ID. as References 49 and 79; positional data should be corrected
4432	Reference 415 has misidentified the object, should be HD 2917213 (see <u>Royal Observatory Annals</u> , No. 7, 1971, p. 22)
5834	This entry is deleted, yet reentered as 21644
6917	This entry is deleted, yet reentered as 21731
7104	Add ADS 6028C
7191	Misidentified, V = 6.54, B-V = +0.46
7212	Misidentified, V = 7.16, B-V = +0.925
7435	Change V = 6.17 to 6.71 (See <u>Royal Observatory Annals</u> , No. 7, p. 86)
9516	Change HD 89173 to 89713
10790	Change HD 104568 to 104479 (See <u>Royal Observatory Bulletin</u> , No. 121, p. E55)
10876	Change V = 11.17 to 10.17 (See <u>Royal Observatory Bulletin</u> , No. 121)
11575	GC indicates GC 17457 = HD 111845 = 8.2 = F2
11576	GC indicates GC 17458 = HD 111844 = 7.7 = A2
12643	Add HR 5397, HD 126367, GC 19449, ADS 9258A
13777	Change V = 5.74 to V = 5.94 (See <u>Royal Observatory Annals</u> , No. 7)
14148	Add ADS 10158AB
15268	Delete BD number
15682	Change HD 165985 to 169985
17679	Change HD 194184 to DM $-74^{\circ} 1887$ ; change positional data (See <u>Royal Observatory Bulletin</u> , No. 121)
20163	This entry is deleted, yet reentered as 21633
21419	Reference 25 appears discrepant when compared to References 120 and 363
21668	U-B for Reference 120 appears discrepant when compared to Reference 88 (is it a $U_C$ -B?)
21729	Change HD 150459 to 150549; change positional data

Table D-2. Discrepancies in Astronomy and Astrophysics  
Supplement (Reference 12)

P.E. ID.	Comments
151	Correction indicated in Table 7 does not agree with catalog
4788	HD 31747 should be the correct number in Table 7
5834	Entry should be in Table 3 since it is omitted from catalog
6917	Entry should be in Table 3 since it is omitted from catalog
7034	Entry should include N in remarks of Table 3
7035	Entry should include N in remarks of Table 3
7663	Table 3 indicates Reference 78 should be omitted, yet it still remains in the catalog
8750	Entry should include N in remarks of Table 3
9516	HD 89713 should be the correct number in Table 7
10268	Entry should include N in remarks of Table 3
10703	ADS 8347D should be the correct number in Table 7
11575	Change HD 11844A to 111844A
11576	Change HD 11745B to 111845B
12911	Entry should be added to Table 3 since data have been changed in the catalog
14085	Change GC 22418 to 22419; add HR 6187 in Table 7
14086	Change HR 6187 to GC 22418 in Table 7
14330	Table 3 indicates a change in U, yet Table 10 shows a change which cannot be correct if the catalog is consulted
14407	Entry should include O(3) in remarks of Table 3
14409	Entry should include O(3) in remarks of Table 3
15175	BD +5° 3511 should be the correct number in Table 7
17256	Entry should include N in remarks of Table 3
20163	Entry should be listed in Table 3 since it is omitted from the catalog
20395	Correction in Table 9 does not agree with catalog (wrong sign)
20505	Entry should be 20605 in Table 3

APPENDIX E

DISCREPANCIES IN THE SAO CATALOG

Table E-1. Discrepancies in SAO

SAO Number	Ref.	Item**	Comments
4071	DM	add $+76^\circ$ 5	
9084	DM	add $+71^\circ$ 889	
9540	DM	add $+69^\circ$ 1070	
10629	DM	add $+74^\circ$ 1006	
12968	DM	add $+60^\circ$ 768	
14788	DM	add $+67^\circ$ 577	
17074	DM	add $+61^\circ$ 1591	
26051	DM	add $+58^\circ$ 982	
30949	DM	add $+58^\circ$ 1809	
32114	DM	add $+52^\circ$ 2572	
33210	DM	add $+59^\circ$ 2334	
44350*	m <sub>pg</sub>	change 0.0 to blank	
46606*	m <sub>pg</sub>	change 0.0 to blank	
48796	DM	add $+44^\circ$ 3234	
56673	DM	add $+31^\circ$ 642	
58636	DM	add $+37^\circ$ 1380	
61125	DM	add $+31^\circ$ 1907 (incorrectly identified in FK3 as $\sigma^2$ Cnc, should be 57 Cnc)	
61391	DM	add $+37^\circ$ 1965	
65485	DM	add $+31^\circ$ 2884	
70505	DM	add $+35^\circ$ 4267	
70919	$\alpha(s)$	change 39.931 to 39.935	
70919	$\delta(")$	change 59.12 to 59.10	
71121	DM	add $+37^\circ$ 4240	
73341	DM	add $+30^\circ$ 4978	
83500	DM	add $+27^\circ$ 2417	
83958	DM	add $+26^\circ$ 2722	
89949	DM	add $+24^\circ$ 4463	
92318*	Erratum Sheet <sup>†</sup>	change SAO number to 92316 and delete is	
101145	DM	add $+14^\circ$ 2770	
106316	DM	add $+14^\circ$ 4369	
110414	m <sub>v</sub>	change 5.7 to 8.7	
110707	DM	add $+2^\circ$ 422	
111195	DM	change $-9^\circ$ 439 to $+9^\circ$ 439	
114258	DM	add $+10^\circ$ 1220	
117112	DM	add $+6^\circ$ 2036	
121658	DM	add $+2^\circ$ 3118	
132071	DM	add $-2^\circ$ 1235	
132406	DM	add $-2^\circ$ 1326	
139620	m <sub>v</sub>	change 5.8 to 8.8	
153500	DM	add $-13^\circ$ 2267	
156167	DM	change $+13^\circ$ 3196 to $-13^\circ$ 3196	
160332	DM	add $-15^\circ$ 4467	

Table E-1. Discrepancies in SAO (Continued)

SAO Number	Ref.	Item**	Comments
168373	DM		add $-29^{\circ}$ 1177
172383*	DM		change $-24^{\circ}$ 1686 to $-23^{\circ}$ 4435
172839*	DM		change $-23^{\circ}$ 4795 to $-23^{\circ}$ 4797
181476	DM		change $-23^{\circ}$ 10994 to $-23^{\circ}$ 10974
187600	DM		add $-30^{\circ}$ 16575
194902	DM		add $-34^{\circ}$ 1614
200047	DM		change $-29^{\circ}$ 2194 to $-29^{\circ}$ 7194
202695	DM		change $-34^{\circ}$ 2610 to $-34^{\circ}$ 7610
203433*	Erratum Sheet†		change SAO number to 203443
204812	DM		change $-32^{\circ}$ 2603 to $-32^{\circ}$ 9603
209957	DM		change $-36^{\circ}$ 12433 to $-36^{\circ}$ 12423
211492	DM		change $-39^{\circ}$ 13317 to $-37^{\circ}$ 13317
215365	DM		add $-47^{\circ}$ 324
216263	$\alpha(s)$		change 55.851 to 55.847
218513/4			These two entries may refer to the same star.
221234	DM		add $-39^{\circ}$ 5580
222199	DM		add $-47^{\circ}$ 6042
222321	DM		add $-48^{\circ}$ 5913
223062	DM		change $-44^{\circ}$ 2614 to $-44^{\circ}$ 7614
223603	DM		add $-48^{\circ}$ 7597
227402	DM		add $-42^{\circ}$ 11646
228851/4			Is there confusion between these two entries?
231444	DM		add $-44^{\circ}$ 15149
231967	DM		change $-59^{\circ}$ 10 to $-59^{\circ}$ 11
234169	DM		change $-55^{\circ}$ 794 to $-52^{\circ}$ 794
235959/61/2			Is there confusion between these three entries?
236232	DM		add $-54^{\circ}$ 1788
238528	DM		change $-50^{\circ}$ 5460 to $-50^{\circ}$ 5463
245242	DM		change $-50^{\circ}$ 10720 to $-50^{\circ}$ 11720 (?)
247287	$\alpha(s)$		change 33.047 to 33.053
252019	DM		add $-67^{\circ}$ 2064
254515	DM		add $-66^{\circ}$ 3417
256894	DM		add $-77^{\circ}$ 772
258866	DM		change $-84^{\circ}$ 4484 to $-84^{\circ}$ 619

\*A previously detected discrepancy which is incorrectly listed on the SAO erratum sheet.

\*\*The column in the SAO where the discrepancy occurs.

†Erratum sheet refers to the SAO erratum sheet (circa 1972).

Table E-2. Discrepancies in SAO (USNO Tape Version)

<u>SAO Number</u>	<u>FK4 Number</u>
21133	2
21609	21
22024	1030
22268	48
23655	99
24276	1105
24672	165
24829	175
24276	1150
25450	1157
25665	237
26312	280
26474	292
27401	368
27670	394
27695	398
27876	416
28315	456
28405	467
28553	483
28737	497
29315	549
29520	571
29765	598
29931	614
30076	627
30447	655
30631	671
31218	707
31652	1507
32378	758
32862	782
33626	813
34137	836
34508	847
35236	875
35879	899

Table E-3. GC Stars Missing from SAO

GC Number	DM Number
213	-59° 11 (possibly SAO 231967?)
492	+16° 33
3171	+14° 439
6483	+13° 852
18773	+41° 2434
23568	+13° 3365
28384	-1° 3976 (possibly SAO 144397?)
30884	+21° 4680
33337	-30° 19790

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